

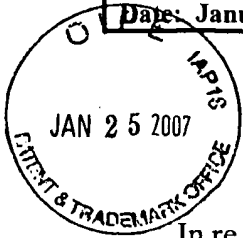
CERTIFICATE OF MAILING

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop: Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: January 23, 2007

Name: Sherry B. Visintainer

Signature: *Sherry B. Visintainer*



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of John W. Evans, et al.

Serial No.: 09/935,982

Filing Date: August 23, 2001

Title: Non-Aqueous Heat Transfer Fluid and Use Thereof

) Examiner: Gregory R. Delcotto

) Confirmation No.: 2268

) Art Unit: 1751

) Docket No.: 97541.00011
(formerly 290397.0011)

Mail Stop: Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF JOHN EVANS

I, John Evans, do hereby declare and say as follows:

1. I am an inventor of the above-referenced patent application regarding methods for use of a non-aqueous heat transfer fluid and the Chairman of the assignee of the patent application, Evans Cooling Systems, Inc. The application presently claims methods of producing an ethylene glycol based, non-aqueous heat transfer fluid having a reduced oral toxicity by mixing propylene glycol and ethylene glycol such that the resulting fluid contains between 5 percent by weight and 30 percent by weight propylene glycol and adding corrosion inhibitors which are soluble in ethylene glycol and propylene glycol.

2. As set forth in the claims presently presented and described in the application at, for example, page 11, lines 18-21, the non-aqueous heat transfer fluids

recited in the methods of the invention contain no additive that requires that water be present in the fluid to dissolve the additive or to enable the additive to function.

Therefore, no water is added to the heat transfer fluid for storage or in use.

3. I have reviewed Reny, WO89/09806. Reny does not exemplify ethylene glycol based coolant compositions which contain no added water or that may contain no more than 0.5% water as an impurity. Rather, when Reny describes ethylene glycol based fluids containing propylene glycol, Reny in each case describes addition of a phosphoric acid buffer to control the pH of the fluid. It is well known to those skilled in the art that phosphoric acid buffers require the presence of water for ionization, a requirement for it to be able to act as an acid.

4. The use of corrosion inhibitors including buffers in heat transfer fluids as described by Reny was consistent with the belief of those skilled in the art at that time, as stated in Reny at page 2, lines 24-27, that “uninhibited glycols used as anhydrous coolants are corrosive to typical cooling system components.” As described by Reny, buffers were typically included in these formulations, particularly ethylene glycol based formulations.

5. I have reviewed Wood, U.S. Patent No. 4,455,248. Wood describes an antifreeze composition for use in automotive cooling systems or other heat transfer services. From my review, it is my understanding that the composition described in Wood contains sodium metasilicate. As set forth in the information sheet from the Occupational Safety & Health Administration attached as Exhibit 1, sodium metasilicate is insoluble in alcohol, and requires the presence of water to remain dissolved in a heat transfer fluid.

6. The Examiner’s statement that a sodium metasilicate-containing heat transfer fluid can contain no water is incorrect. Even in a concentrate form, water is required in the fluid to maintain the sodium metasilicate in solution. If there is insufficient water in the fluid to maintain the sodium metasilicate in solution, the sodium

metasilicate can precipitate out of solution and form a gel. It is then virtually impossible to resolubilize the material. A person skilled in the art, reading Wood in its entirety, would find Wood's statement that the fluid can contain "little or no water" to be incorrect to the extent that it suggests that a sodium metasilicate containing heat transfer fluid, even in a concentrate form, can contain no water.

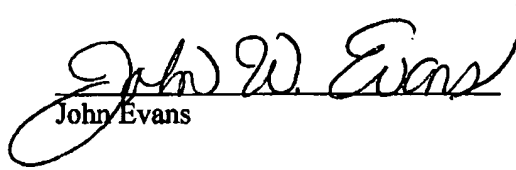
7. Wood states that in use, the fluid requires additional water. This is required at least to ensure that the additives remain in solution during use. I have conducted engine tests using fluids that contain sodium metasilicate, and I have observed that these fluids will form precipitates in use if there is insufficient water in the fluid. This problem has also been widely reported and is well known to those skilled in the art. Accordingly, a person skilled in the art reading Wood would not understand Wood to teach or describe a heat transfer fluid that could be used without water.

8. As described in the present patent application at pages 20-24, in testing that I directed, we discovered that the addition of relatively small amounts of propylene glycol to ethylene glycol based heat transfer fluids unexpectedly reduced the toxicity of the fluid below the levels that would have been predicted by those skilled in the art. As described in the application, at a 70/30 ratio of ethylene glycol to propylene glycol, the LD₅₀ for the oral toxicity of the fluid in rats was greater than 21,000 mg/kg, much higher than the predicted value of 5,762 mg/kg and higher than the LD₅₀ value of 20,000 mg/kg for pure propylene glycol.

9. This was result was unexpected, and it is still not completely recognized by those skilled in the art. For example, as described in the pages from the Peak antifreeze web site attached as Exhibit 1, the manufacturer of a pure propylene glycol heat transfer fluid continues to state that the addition of ethylene glycol will "eliminate the safety advantages" of the propylene glycol fluid.

I, the undersigned, declare further that all statements made herein are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: January 23, 2007


John Evans

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